

# Samuel Wortley Sage

AI / Gameplay Programmer

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## Academic Projects

### Independent AI / World Generation Project Sep 2019 - Present

- ❖ Generated custom terrain with Perlin noise and diamond-square algorithms
- ❖ Textured terrain with Unity Shader Graph based on height and moisture
- ❖ Populated biomes with environmental props using Perlin noise
- ❖ Constructed UI to live-update generation parameters and view changes

### Technical Director/ AI Programmer, *Hallowed Under* Sep 2018 - Apr 2019

- ❖ Built 3D game engine for team of 20 artists, designers, musicians and coders
- ❖ Designed and wrote modular editor to quickly build and iterate game levels
- ❖ Developed core functionality in C++ using slotmap for constant time insertion, access, and deletion of components and objects
- ❖ Programmed Unity behavior tree framework for quick design iteration
- ❖ Wrote enemy AI with patrol paths, sight cones, and navmesh navigation
- ❖ Led team in pivoting from custom engine to Unity to meet milestone goals

### Technical Director/ Co-Producer, *Daybreak* Sep 2017 - Apr 2018

Featured at PAX West 2018 | [games.digipen.edu/games/daybreak-1](http://games.digipen.edu/games/daybreak-1)

- ❖ Wrote engine and gameplay in C++ for a 2D game using ECS architecture
- ❖ Implemented physics, serialization, particle, and flocking AI systems
- ❖ Engineered system analytics to identify and fix inefficient systems
- ❖ Led 6 coders in documentation, coding standards, and code reviews

### Other AI Projects

- ❖ Built A\* pathfinding with smoothing, rubberbanding, and 4 heuristics
- ❖ Used influence mapping and propagation to implement cover analysis, visibility, and hide-and-seek AI between agents
- ❖ Developed group zombie-survival AI using Goal Oriented Action Planning

## Professional Experience

### Web Developer, *World Wide Lightning Location Network* Jun 2018 - Present

- ❖ Built website to report data on live hurricanes around the world
- ❖ Worked in existing backend database using Python, Django, and MySQL
- ❖ Designed frontend site using HTML, CSS, Javascript, and Bootstrap

### Web Developer, *Department of Workforce Development* Sep 2015 - Jun 2016

- ❖ Developed web content using HTML, CSS, and Javascript
- ❖ Applied Scrum technique to work professionally with multiple large teams
- ❖ Met deadlines on 3 or more projects simultaneously

## Languages

- ❖ C, C++ *(Proficient)*
- ❖ C# *(Proficient)*
- ❖ HTML, CSS *(Proficient)*
- ❖ JavaScript *(Familiar)*
- ❖ Python *(Familiar)*
- ❖ Java *(Familiar)*

## AI Techniques

- ❖ A\* Pathfinding
- ❖ Influence Mapping
- ❖ GOAP AI
- ❖ Smart Objects
- ❖ Behavior Trees
- ❖ State Machines
- ❖ Flocking / Herding

## Tools

- ❖ Unity
- ❖ Version Control
- ❖ Windows, Linux
- ❖ GCC, G++
- ❖ Doxygen
- ❖ Visual Studio
- ❖ Photoshop, Maya

## Professional Skills

- ❖ Agile Methodology
- ❖ Time Management
- ❖ Peer Teaching

## Education

**BS in CS and Game Design**

DigiPen Institute of Technology

**Graduate Apr 2020**

- ❖ Cumulative GPA: 3.50